Cutting Compound Angles for Studio Stands

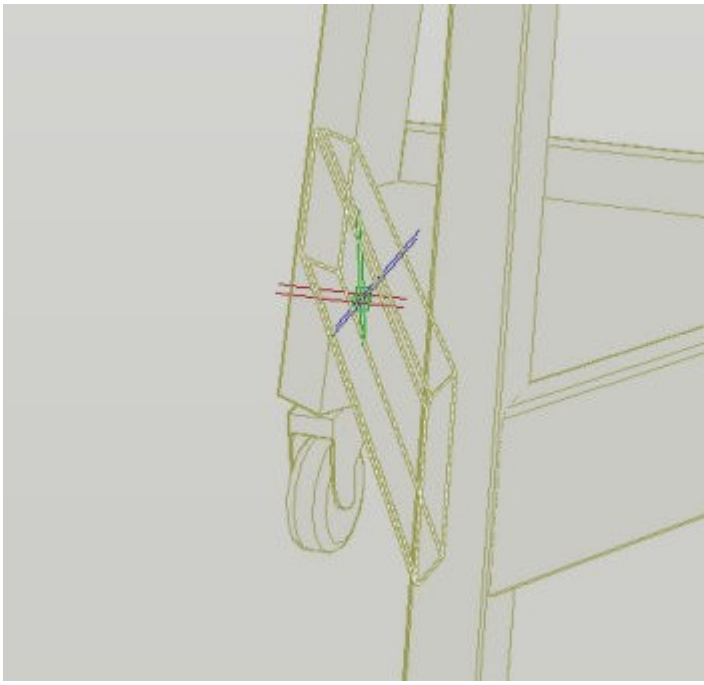
Excerpts from The Message Boards

Mark Meier (Ann Arbor, MI): asked for help in cutting compound angles for some stands to roll around the studio while sculpting (clay). They have three legs which taper outward from top to bottom.

I've built the easy stuff…thanks to Ed Mulligan's response to my question about an easy way of cutting a perfect hexagon. Thanks, Ed!

Now I need to make the bases. In a pure side view the leg is at an angle of 12° from vertical. The rails join the legs to form triangles in plan. So the angles on the ends of the rails are 30°. However I think that's affected by the outward taper of the legs. But this is what I'm unsure about.

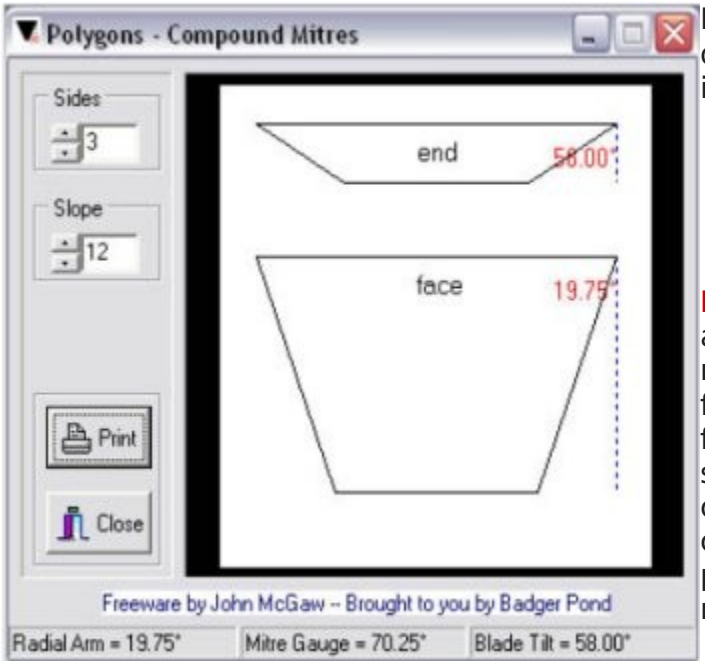
I've never cut compound angles before so I'm not sure if I can really use 12 and 30° or if they combine in some way that changes them.



Does anyone have a recommendation for a method of calculating and cutting these accurately?

J. Laux: Compound Miter spreadsheet has worked for me: (link below)

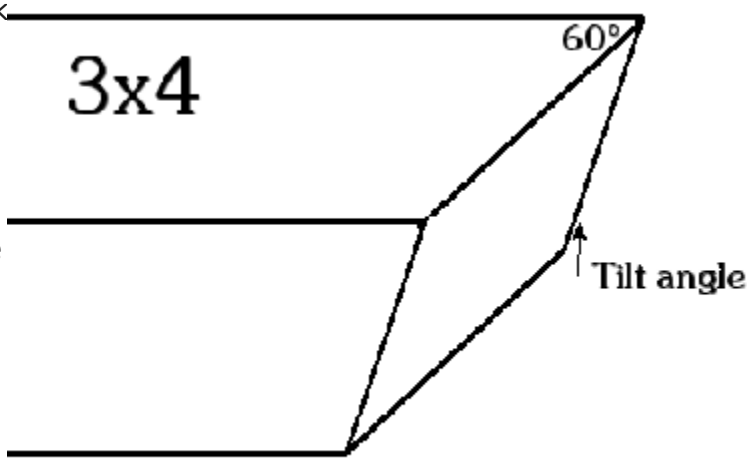
John McGaw: Try this as a starting point: Compound Miter Calculator (download zip file and extract spread sheet) .



My program has generally been quite accurate just as long as the input is the style that it expects.

Ellis Walentine: You can't cut that angle with a table or compound miter saw without some sort of fixture. What I would do is make a fixture to hold the rail such that a straight 90° chop cut will cut the compound bevel (assuming your chop saw has a big enough blade to plunge through the height of your rails).

To make the fixture, you need to k trigonometric function of the 12° leg angle (math jocks, help me here—I don't want to have to figure out the trig, though I've done it many times). Then find a 3×4 or something substantial to make the fixture out of. Swing the CMS angle 30° to the left and tilt the saw's bevel angle to the actual tilt angle of the rail. Cut off your 3×4 at this angle. Make a mirror image fixture for the other side of the blade.



Now, all you have to do is stand your rail stock against the cut edge of your fixture(s) and make a 90° cut. There isn’t going to be much room to hold the rail to the fixture firmly, so you might want to screw a 1×4 to the face of the fixture to give you something you can clamp the rails to.